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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,472	04/01/2004	Guillaume Bouche	02-GR1-262	6360

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EXAMINER

DOUGHERTY, THOMAS M

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 04/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/815,472

Applicant(s)

BOUCHE ET AL.

Examiner

Thomas M. Dougherty

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 January 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) \*
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) \*
- Paper No(s)/Mail Date 404.
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

Claims 12 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Use of a narrower range within a broader range in the same claim renders the claim indefinite since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. One could not tell from such a claim if the narrower range or limitation is a restriction or limitation of the broader range or limitation. The term "preferably" is a linking term that follows a broad range. The use of the term is not indefinite per se, but its use to link broad and narrow ranges renders the claims indefinite.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Claims 1-5 and 7-13 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Bradley et al. (EP 1 058 383 A2). Bradley et al. teach (column 17, lines 31-52) and show (e.g. figs. 4, 5A, 5B) an electronic component comprising: a substrate and at least two piezoelectric resonators (76, 77) each having an active element, a lower electrode (88, 89) and an upper electrode (83, 85), wherein the lower electrode (88) of the first resonator (76) is made of a material that is different from that of the lower electrode of the second resonator such that the resonators exhibit different resonance frequencies. Again see col. 17, ll. 31-52.

The resonance frequencies may differ by at least 10%. Note that this is regarded as a goal of the invention. As Bradley et al. show and teach the claimed structure, this is regarded as being inherently met.

Each resonator (76, 77) includes a lower electrode (88, 89), an active element (78) and an upper electrode (83, 85), the lower electrode of a first resonator being of different thickness from that of the lower electrode of a second resonator. See col. 17, ll. 31-52 where different thicknesses are also noted.

Each resonator (76, 77) includes a lower electrode (88, 89), an active element (78) and an upper electrode (83, 85), the upper electrode (83) of a first resonator (76) being made of a material that is different from that of the upper electrode (85) of a second resonator (77). Again see col. 17, ll. 31-52.

Each resonator (76, 77) includes a lower electrode (88, 89), an active element (78) and an upper electrode (83, 85), the upper electrode (83) of a first resonator (76) being of thickness that is different from that of the upper electrode (85) of a second resonator (77). Again see col. 17, ll. 31-52 where it is noted both thickness and electrode materials may be different in respective resonators.

At column 17, lines 18-21, Bradley et al. note that each resonator (76, 77) besides includes a lower electrode (88, 89), an active element (78) and an upper electrode (83, 85), the active element (78) of a first resonator (76) may have a thickness that is different from that of the active element (78) of a second resonator (77).

The electronic component (100) includes at least three resonators (101, 103, 105 et al.) exhibiting resonance frequencies belonging to at least three different frequency bands. See col. 3, line 58 to column 4, line 1.

The electronic component (100) includes four resonators (101, 103, 105, 107 et al.) exhibiting resonance frequencies belonging to four different frequency bands. Again see col. 3, line 58 to column 4, line 1.

The electrodes are made of a material chosen from aluminum, copper, molybdenum, nickel, titanium, niobium, silver, gold, tantalum, lanthanum, platinum and tungsten. See col. 6, lines 8-11.

The active element includes crystalline aluminum nitride, zinc oxide, zinc sulfide, ceramic including  $\text{LiTaO}_3$ ,  $\text{LiNbO}_3$ ,  $\text{PbTiO}_3$ ,  $\text{PbZrTiO}_3$ ,  $\text{KNbO}_3$  and/or lanthanum. See col. 6, line 6.

The active element (78) has a thickness of between 0.5 and  $5\mu\text{m}$ , preferably between 1 and  $3\mu\text{m}$ .

The electrodes (83, 85, 88, 89) have a thickness of less than  $1\mu\text{m}$ , preferably less than  $0.3\mu\text{m}$ .

Each resonator (76, 77) includes a lower electrode (88, 89), an active element (78) and an upper electrode (83), the active element (78) of a

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley et al. (EP 1 058 383 A2) in view of Larson III, et al. (US 6,927,651). Given the invention of Bradley et al. as noted above they do not show a resonator being made of a material that is different from that of an active element of a second resonator.

Larson III, et al. note at col. 3, lines 9-12 and in claim 5 that first and second resonator active elements can be made of different materials.

Larson III et al. don't show the electrode configuration with different materials for bottom electrodes of a pair of resonators on a substrate.

It would have been obvious to one having ordinary skill in the art to employ different materials for the active elements in the invention of Bradley et al. as is taught by Larson III since this is a known method of achieving resonators with different resonant frequencies.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The remaining prior art cited reads on some aspects of the claimed invention. Note that Whatmore et al. clearly allude to use of different materials for electrodes at their third paragraph.

Direct inquiry to Examiner Dougherty at (571) 272-2022.

*tmd*  
tmd

March 30, 2006

*Thomas M. Dougherty*

**TOM DOUGHERTY  
PRIMARY EXAMINER**